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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/888,668	06/25/2001	Meng Yao	D/A1265	8867

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EXAMINER

HUNTSINGER, PETER K

ART UNIT	PAPER NUMBER
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2624

DATE MAILED: 09/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/888,668

Applicant(s)

YAO, MENG

Examiner

Peter K. Huntsinger

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– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 June 2005.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-15 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The amendment filed on 21 June 2005 has been entered in full.

Response to Arguments

2. Applicant's arguments filed 21 June 2005, with respect to claim 1 and 9, have been fully considered but they are not persuasive.

Applicant argues on page 7-10 of the response that:

Stanich et al. do not teach screens in which the threshold values corresponding to gray levels between g.sub.s2 and g.sub.s3 coincide with white positions in the constraining checkerboard pattern wherein the gray level g.sub.s3 correspond to a black dither of 50% or less and the gray level g.sub.s2 corresponds to a black dither that is less than (i.e. lighter than) that of g.sub.s3.

- a. Examiner respectfully disagrees. Stanich et al. disclose not placing pixels vertically or horizontally adjacent to each other until after a gray level threshold (col. 5, lines 30-36). Utilizing the checkerboard pattern (col. 5, lines 16-19), this limits using a constrained checkerboard pattern until a gray level threshold is reached. After the threshold is reached a new clustering criteria can be set to only place black pixels horizontally or vertically next to preexisting black pixels (col. 5, lines 23-36). A checkerboard pattern of with black pixels at every 45

degree angle pixel (col. 6, lines 61-66) would correspond to a 50% dither. While the applicant states that g.sub.s2 corresponds to a black dither that is lighter than g.sub.s3, that limitation is not included in the independent claims 1 and 9.

Therefore, a g.sub.1 level of 100%, a g.sub.2 level of 50%, and a g.sub.3 level of 0% would fulfill the limitation $g.sub.1 > g.sub.2 > g.sub.3$.

3. Applicant's arguments filed 21 June 2005, with respect to claim 6, have been fully considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 2, and 9 are rejected under 35 U.S.C. 102(e) as being anticipated by Stanich et al. U.S. Patent 6,597,813.

Referring to claims 1 and 9, Stanich et al. disclose a halftone processor for converting a gray scale image comprising a plurality of m-bit pixels to a halftoned image comprising a plurality of n-bit pixel images, where $m > n$, the processor comprising: a memory storing a stochastic screen, the screen comprising a set of threshold values

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(dither mask 13 of Fig. 1, col. 4, lines 11-17); and a comparator receiving the gray scale image and the screen, the comparator comparing, on a pixel-by-pixel basis, a value of each pixel in the gray scale image to a corresponding threshold value in the screen to produce the halftoned image (comparator 14 of Fig. 1, col. 4, lines 14-16); wherein substantially all the threshold values corresponding to gray levels between g.sub.s1 and g.sub.s2 coincide with black positions in a constraining checkerboard pattern and substantially all the threshold values corresponding to gray levels between g.sub.s2 and g.sub.s3 coincide with white positions in the constraining checkerboard pattern (col. 3, lines 29-37. Stanich et al. do not disclose expressly memory storage for the stochastic screen. It is inherent that the stochastic screen of Stanich et al. would need to be stored on RAM for the screen to be applied to the image and the halftoning process to be preformed. Stanich et al. disclose not placing pixels vertically or horizontally adjacent to each other until after a gray level threshold (col. 5, lines 30-36). Utilizing the checkerboard pattern (col. 5, lines 16-19), this limits using a constrained checkerboard pattern until a gray level threshold is reached. A checkerboard pattern of with black pixels at every 45 degree angle pixel (col. 6, lines 61-66) would correspond to a 50% dither. While the applicant states that g.sub.s2 corresponds to a black dither that is lighter than g.sub.s3, that limitation is not included in the independent claims 1 and 9. Therefore, a g.sub.1 level of 100%, a g.sub.2 level of 50%, and a g.sub.3 level of 0% would fulfill the limitation $g.sub.1 > g.sub.2 > g.sub.3$.

Referring to claim 2, Stanich et al. disclose the processor of claim 1, wherein the halftoned image comprises a plurality of 1-bit pixels (col. 4, lines 40-42).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 3-6, 7, 8, and 10-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stanich et al. U.S. Patent 6,597,813 and Chen et al. U.S. Patent 4,668,995.

Referring to claim 6, Stanich et al. disclose a method of generating a halftone screen for converting an image received at d levels, for reproduction at c levels, where $d > c$, the method, in optional sequence, including: (A) generating an initial screen pattern for a first gray level, the initial screen pattern being designed to provide a visually pleasing, blue noise dot pattern when thresholded and wherein substantially all black pixels in the initial screen pattern correspond to black pixels in a constraining checkerboard pattern (block 21 of Fig. 2, col. 5, lines 9-37); (B) generating a subsequent screen pattern corresponding to a specific gray level that is darker than the first gray level, the subsequent screen pattern maintaining the arrangement of black pixels of any screen pattern corresponding to a lighter gray level and further including at least one more black pixel, wherein the least one more black pixel is at a location corresponding to a black pixel in the constraining checkerboard pattern (block 25 of Fig. 2, col. 5-6, lines 60-67, 1-6); (C) repeating (B) for a plurality of specific gray levels

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between the first gray level and a second gray level (block 28 of Fig. 2, col. 6, lines 6-16); (D) generating a second subsequent screen pattern corresponding to a specific gray level that is darker than the second gray level, the second subsequent screen pattern maintaining the arrangement of black pixels of every screen pattern corresponding to a lighter gray level and further including at least one more black pixel, wherein the least one more black pixel is at a location corresponding to a white pixel in the constraining checkerboard pattern (block 42 of Fig. 3, col. 6, lines 22-28); and (E) repeating (D) for a plurality of gray levels between the second gray level and a third gray level (block 46 of Fig 3., col. 6, lines 39-43). Stanich et al. do not disclose expressly the specific gray level value of 50%. Chen et al. disclose a specific gray value of 50% (level 8 of Fig. 3). Stanich et al. and Chen et al. are combinable because they are from the same field of halftoning. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to place black pixels on white spaces in a checkerboard before a gray level value of 50%. The motivation for doing so would have been to eliminate objectionable periodic patterns in the halftone and thus increase image quality (col. 8, lines 3-24 of Stanich). Therefore it would have been obvious to combine Chen et al. with Stanich to obtain the invention as specified in claim 6.

Referring to claims 3, 7, and 10, Stanich et al. disclose threshold values corresponding to gray levels for constraining a checkerboard pattern but do not disclose expressly a specific percent black dither that correspond to the gray levels. Chen et al. disclose a specific gray level value of approximately 5% (level 15 of Fig. 3) and a

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specific gray level of approximately 40% (level 10 of Fig. 3). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to assign thresholds between a 5% black dither and a 40% black dither to a first gray level group. The motivation for doing so would have been to eliminate objectionable periodic patterns in the halftone and thus increase image quality (col. 8, lines 3-24 of Stanich). Further, Stanich et al. disclose a generic gray level from which to switch patterns and 5% and 40% are simply two of many specific gray levels. Therefore it would have been obvious to combine Chen et al. with Stanich to obtain the invention as specified in claims 3, 7, and 10.

Referring to claims 4, 8, and 11, Stanich et al. disclose threshold values corresponding to gray levels for constraining a checkerboard pattern but do not disclose expressly a percent black dither that correspond to the gray levels. Chen et al. disclose a specific gray level value of approximately 40% (level 10 of Fig. 3) and a specific gray level of approximately 50% (level 8 of Fig. 3). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to assign thresholds between a 40% black dither and a 50% black dither to a second gray level group. The motivation for doing so would have been to eliminate objectionable periodic patterns in the halftone and thus increase image quality (col. 8, lines 3-24 of Stanich). Further, Stanich et al. disclose a generic gray level from which to switch patterns and 40% and 50% are simply two of many specific gray levels. Therefore it would have been obvious to combine Chen et al. with Stanich to obtain the invention as specified in claims 4, 8, and 11.

Referring to claim 5, Stanich et al. disclose threshold values corresponding to gray levels for constraining a checkerboard pattern but do not disclose expressly a percent black dither that correspond to the gray levels. Chen et al. disclose a specific gray level value of approximately 5% (level 15 of Fig. 3), a specific gray level of approximately 40% (level 10 of Fig. 3), and a specific gray level of approximately 50% (level 8 of Fig. 3). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to assign thresholds between a 5% black dither and a 40% black dither to a first gray level group, and thresholds between a 40% black dither and a 50% black dither to a second gray level group. The motivation for doing so would have been to eliminate objectionable periodic patterns in the halftone and thus increase image quality (col. 8, lines 3-24 of Stanich). Further, Stanich et al. disclose a generic gray level from which to switch patterns and 5%, 40%, and 50% are simply three of many specific gray levels. Therefore it would have been obvious to combine Chen et al. with Stanich to obtain the invention as specified in claim 5.

Referring to claims 12 and 14, Stanich et al. disclose threshold values corresponding to gray levels for constraining a checkerboard pattern but do not disclose expressly a percent black dither that correspond to the gray levels. Chen et al. disclose a specific gray level of approximately 40% (level 10 of Fig. 3). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to assign a threshold of 40% to a gray level group. The motivation for doing so would have been to eliminate objectionable periodic patterns in the halftone and thus increase image quality (col. 8, lines 3-24 of Stanich). Further, Stanich et al. disclose a generic gray level from

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which to switch patterns and 40% is simply one of many specific gray levels. Therefore it would have been obvious to combine Chen et al. with Stanich to obtain the invention as specified in claim 12 and 14.

Referring to claims 13 and 15, Stanich et al. disclose threshold values corresponding to gray levels for constraining a checkerboard pattern but do not disclose expressly a percent black dither that correspond to the gray levels. Chen et al. disclose a specific gray level of approximately 15% (level 14 of Fig. 3). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to assign a threshold of 15% to a gray level group. The motivation for doing so would have been to eliminate objectionable periodic patterns in the halftone and thus increase image quality (col. 8, lines 3-24 of Stanich). Further, Stanich et al. disclose a generic gray level from which to switch patterns and 15% is simply one of many specific gray levels. Therefore it would have been obvious to combine Chen et al. with Stanich to obtain the invention as specified in claim 13 and 15

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter K. Huntsinger whose telephone number is (571)272-7435. The examiner can normally be reached on Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Moore can be reached on (571)272-7437. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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